DOCUMENT RESUME

ED 330 860 CE 057 645

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TITLE Youth Apprenticeship, American Style: A Strategy for Expanding School and Career Opportunities. Report of a Conference (Washington, D.C., December 7, 1990).
INSTITUTION Northeast Wisconsin Technical Coll., Green Bay.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 7 Dec 90
CONTRACT 43-3J47-0-00869
NOTE 48p.
PUB TYPE Collected Works - Conference Proceedings (021) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Apprenticeships; Basic Skills; Business Responsibility; Educational Needs; *Educational Policy; *Education Work Relationship; Futures (of Society); *Models; *Noncollege Bound Students; Policy Formation; Productivity; Public Policy; *School Business Relationship; Secondary Education

ABSTRACT

Proceedings of a conference that examined the merits of a youth apprenticeship approach for the United States are summarized in this report. Participants included representatives of business, labor, education, and government. The report follows the outline of the conference sessions, presenting a rationale for a new system of preparing noncollege-bound youth for productive membership in the nation's economic and social life, outlining principles that should guide such a system, delineating a proposed model system, critiquing the model, and responding to the criticism from advocates of youth apprenticeship. Three appendixes contain the following: (1) a list of youth apprenticeship technical assistance resources, grouped in categories of work-based learning, school-business partnerships, vocational education, curriculum development, school restructuring, and youth employment; (2) a 129-item bibliography grouped into the categories of education and work in a changing society, changes in workplace skills, the state of schools and the need for reform, the rationale for linking education and work, school improvement through business partnerships, vocational education and its reform, schooling and work--lessons from overseas, and work-based learning--current practice, future prospects; and (3) a list of youth apprenticeship programs. (KC)

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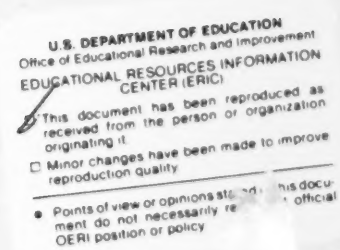
Report of a Conference

Youth Apprenticeship, American Style:

A Strategy for Expanding School and Career Opportunities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CE057645

December 7, 1990
Washington, D.C.

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Youth Apprenticeship, American Style: A Strategy for Expanding School and Career Opportunities

By William E. Nothdurft and Jobs for the Future

Published by the Consortium on Youth Apprenticeship:

Academy for Educational Development/National Institute for Work and Learning
American Association of Community and Junior Colle
American Federation of Teachers
CDS International
Children's Defense Fund
Council of Governors Policy Advisors
Corporation for Enterprise Development
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William T. Grant Foundation Commission on Youth and America's Future
Youth Policy Institute

Report of a Conference

December 7, 1990

Washington, D.C.

Preface:

On December 7, 1990, over 350 representatives of business, labor, government, schools, and not-for-profit and community-based organizations involved in youth policy, education, and employment and training gathered in Washington D.C., for a day-long conference to examine the merits of "Youth Apprenticeship, American Style." Organized by the William T. Grant Foundation Commission on Youth and America's Future and co-sponsored by thirty-six different groups, the day was marked by a high level of discussion and debate on the rationale for and the pros and cons of one particular model of integrating school and work—a concept known as youth apprenticeship.

In the morning, the case for exploring the viability of a national system to improve the linkage between young people, their schools, employers, and post-secondary educational institutions was made in presentations by Governor Bill Clinton of Arkansas; Ira Magaziner, Chair of the Commission on the Skills of the American Workforce; Stephen F. Hamilton of Cornell University, author of the recently published *Apprenticeship for Adulthood* on the German apprenticeship system and its relevance for the U.S.; Dr. Robert I. Lerman, an economist at The American University and co-author of a Fall 1990 article in *The Public Interest* arguing for a U.S. youth apprenticeship system; Jere Jacobs, Assistant Vice-President of Pacific Telesis and Deputy Chairman of the California Business Roundtable's Education Task Force; and Hilary Pennington, President of Jobs for the Future, which is involved in a multi-year effort to advance the knowledge and practice of youth apprenticeship in this country. A brisk question and answer period, moderated by Doug Ross, President of the Corporation for Enterprise Development, followed the presentations. (See conference agenda which follows this preface for full listing of conference panelists.)

In the afternoon, representatives of business, labor, education, and government presented their views on the promise—and the obstacles to—widespread adoption of youth apprenticeship in this country. From the floor, conference participants added their own comments and concerns. By the end of the day, an impressive array of proposals, concerns, facts and opinions had been expressed.

Acknowledging the widespread interest in efforts to adapt some of the lessons of European apprenticeship systems to our own national realities, the Office of Educational Research and Improvement of the U.S. Department of Education commissioned Jobs for the Future, a conference co-sponsor, to prepare and disseminate this report on the day's presentations and deliberations. The following pages, crafted by Bill Nothdurft, integrate the presentations, the floor comments, and written materials from panelists and other experts into an articulate brief for "youth apprenticeship, American style."

The report follows the broad outline of the day's presentations:

- The rationale for a new system of preparing the non-college bound for productive engagement in the nation's economic and social life;
- Principles that should guide such a system;
- The outline of one specific proposal;
- Assessment of and criticism of the model; and
- Responses to the criticism from advocates of youth apprenticeship.

This report is designed to provide an easily accessible record of the conference discussion to both those who attended the sessions and those who did not. It is meant to be a spur to dialogue, debate, research, program experimentation, and policy. It is an invitation to join—and extend—the conversation that began in Washington on December 7, 1990.

Financial support for the conference was provided by the U.S. Department of Labor, William T. Grant Foundation, The Pew Charitable Trusts, and Siemens USA.

The views expressed in this report are not necessarily shared by the U.S. Department of Education. This publication was funded by the U.S. Department of Education, Office of Educational Research and Improvement, grant number 43-3J47-0-00869.

Youth Apprenticeship, American Style

Agenda

December 7, 1990

Holiday Inn Capitol,
6th and
C Streets, SW,
Washington, D.C.

9:00 a.m. **Welcoming Remarks**

Conference Objectives and Definitions:
What We Mean by "Youth Apprenticeship, *American Style*"
Hilary Pennington, Jobs for the Future

9:10 a.m. **Keynote**
Introduction: Will Marshall,
Progressive Policy Institute

"The Case for Change: America's Future; A Call to National Leadership" Bill Clinton, Governor, State of Arkansas

9:30 a.m. **Panel on Proposals**
Moderator: Doug Ross,
Corporation for Enterprise Development

(1) **"Closing the Skills Gap: The Case for Youth Apprenticeship"** Ira Magaziner, Chair, Commission on the Skills of the American Workforce

(2) **"Essential Elements of the European Apprenticeship System and American Adaptations"** Stephen F. Hamilton, Cornell University

(3) **"Youth Apprenticeship: A Mainstream Reform with a Hidden Agenda"** Robert I. Lerman, The American University

(4) **"An Employer's Proposal for California Youth"** Jere Jacobs, Assistant Vice-President, Pacific Telesis

11:00 a.m. **Q and A**

Audience Interaction with Morning Panel

12:00 p.m. **Commentary** on Morning Session and Some Questions to Think About Over Lunch

William Raspberry, The Washington Post

12:15 p.m. **Luncheon:**

Introduction by James Van Erden, Administrator, Office of Work-based Learning, U.S. Department of Labor

"What's the Federal Role in Promoting Youth Apprenticeship?"
Roberts T. Jones, Assistant U.S. Secretary of Labor for Employment and Training and Christopher Cross, Assistant U.S. Secretary of Education for Educational Research and Improvement

1:45 p.m. **Panel on Employer & Labor Views:**
Moderator: Pierce Quinlan, National Alliance of Business

"Youth Apprenticeship: Will it Fly? Should it Fly?"
Robert Coy, Director, Office of Technology Development, Pennsylvania Department of Commerce

Hans W. Decker, President, Siemens USA

Barbara A. Green, Vice-President, Greater New York Hospital Association and Chair, Federal Committee on Apprenticeship

Raymond L. Bramucci, New Jersey Commissioner of Labor

Audience Participation

3:00 p.m. **Panel on Education and Training Views:**
Moderator: Cindy Brown, Council of Chief State School Officers

Herbert Grover, Wisconsin Superintendent of Public Instruction and President, Council of Chief State School Officers

Mary W. Roberts, Commissioner, Oregon Bureau of Labor and Industries

Piedad Robertson, President, Bunker Hill Community College

Audience Participation

4:00 p.m. **Closing Session**

Concluding Observations: "The Road Ahead"
Ray Marshall, Lyndon B. Johnson School of Public Affairs, University of Texas at Austin

Youth Apprenticeship, American Style: A Strategy for Expanding School and Career Opportunities

At the age of 16, the average German—or Austrian, or Swiss, or Danish—young person begins the transition to adulthood: leaving compulsory secondary school and entering the world of work through a gentle process by which workplace learning gradually supplants classroom learning. Though the specifics vary from country to country, these programs—*apprenticeships*—have at least one thing in common: they present young people with many paths to a future of increasing responsibility, skill, recognition, income, and independence.

At the age of 16, the average Arkansas—or New York, or California—young person faces two more years of a compulsory education that too often seems, and generally is, irrelevant to the world of work. Frustrated, bored, and attracted by the money they earn at after-school jobs, roughly half drop out or simply mark time until graduation. Then, unable or unwilling to pursue higher education, they drift from one low-skill dead end job to another, until they "settle down" at age 25 or so. In an economy that no longer has high-paying jobs for low-skill workers, what they settle for is a life of sharply reduced horizons. In Arkansas, for example, college graduates earn twice as much as high school graduates after their first year of work.[1] Inflation-adjusted average earnings of workers under 25 with only a high school diploma are 28 percent lower today than they were 15 years ago, 42 percent lower for high school dropouts.[2] These are the lucky ones. Many young people earn nothing at all: the unemployment rate for teenage workers nationwide was 15.8 percent in August 1988, and 32.4 percent for black teens.[3] And things don't improve much as these young people age; the unemployment rate for non-college adult workers is substantially higher than the national average. "The plain fact," says Arkansas Governor Bill Clinton, a national leader in education reform, "is that people who do not go on to some kind of higher education will be poor *forever.*"[4]

In a nation that for generations has promised opportunity and a better life for one's children, this is a waste of human talent of tragic proportions. In a global economy where a highly skilled workforce is the prerequisite to growth, it is a prescription for economic decline.

The Choice: American "Know-How" or "American Low-Brow"?

The good news is that there is no skills shortage. This is also the bad news.

William E. Brock
Former Secretary of U.S. Department of Labor, Co-Chair, Commission on the Skills of the American Workforce

During the last 15 years, America's economic machine has ground nearly to a halt. Real wages have declined an average of 15 percent and a dozen nations now pay better wages than we do. More alarming, the distribution of income in America (the gap between rich and poor) has become the most inequitable of any industrialized nation in the world.[5] To the extent that the American economy has grown at all during this period, it has done so principally by increasing borrowing (some $1 trillion since 1982 alone) and by increasing the number of people who are working—especially "baby boomers" and women (50 percent of our people work today compared to 40 percent in 1973).[6]

What has *not* increased appreciably is productivity. American private, nonagricultural worker productivity growth has averaged a scant one percent per year in the past 15 years—compared to 3.5 percent in Europe, 6 percent in Japan, and 10 percent in the newly industrialized nations of Asia.[7]

Despite these sobering figures, most of America's manufacturers seem unperturbed. Leading corporations like Xerox, General Electric, Motorola, and American Express, among others, have called for education reform to improve worker productivity, but according to a recent Grant Thornton survey of 250 mid-size manufacturers, most firms feel no need to upgrade workforce skills. Two thirds of the firms surveyed by Grant Thornton agreed they had a productivity problem, but more than half considered it minor: they plan to solve it by replacing people with machines.[8] The Commission on the Skills of the American Workforce recently surveyed several hundred American firms and 80 percent responded that they saw no deficiency in the education or skills of their workers (apart from attitude, appearance, and related "work ethic" issues).[9] The companies saw no skills shortage, the Commission concluded, because they don't require much of their workers. To cope with increasing international competition, these firms have responded by "dumbing down" the tasks workers do, hiring "contingent", or part-time workers in order to avoid paying fringe benefits, and thus competing by lowering wages.

This "low-brow" approach to competition is remarkably shortsighted and ultimately doomed to failure. The United States simply cannot compete with the Third World on wages. What's more, developing countries today have access to the same manufacturing technologies that are available in the U.S. and are already competing with American producers on the basis of quality as well as price. Faced with the impossibility of producing cheaper, American firms must compete by producing *smarter*—improving product quality more rapidly, introducing new products more frequently, and customizing products to meet the needs of narrow market niches.[10]

But "producing smarter" in conventional factories requires more planners, designers, supervisors, managers, and inspectors to think, oversee, and correct production workers—an unwieldy, inefficient, and ultimately costly and uncompetitive system. The alternative is to change the organization of work so that production workers, individually and in teams, do their *own* planning, designing, supervising, and managing. The Commission on the Skills of the American Workforce calls such arrangements "high performance work organizations." Only five percent of the firms the Commission surveyed, however, have begun shifting production systems in this direction. The vast majority of American firms struggle on with traditional work organizations, unwilling to face the disruption created by the shift toward high performance production, to make the investments necessary to beat the competition, or to wait for the returns from such investments to be realized. Slowly but inevitably, their competitive position is eroding, their productivity is slowing, the standard of living of their workers is declining, and the economic horizons of their children are shrinking.

A Crisis of Competence

While most American firms appear, for now, to have chosen the low-wage route, the five percent that have reorganized production systems for high performance have discovered an obstacle their foreign competitors don't confront: a workforce without the education and skills necessary to do the job.

Item: Moving rapidly to create high performance plants where workers are able to maintain, program, and trouble-shoot the sophisticated machines that produce its communications products, Motorola decided to hire only people who could do fifth-grade math and read at the seventh-grade level. Against these criteria, half of the applicants tested for a new plant in Illinois last year failed. By 1993, Motorola will have spent $35 million—four times its investment in equipment—to teach basic reading to its employees.

Our front-line workers are not able to compete in the economic arena because they are increasingly unable to compete in the educational arena.

Commission on the Skills of the American Workforce

Item: When Baldor Electric, an Arkansas-based electronics firm, introduced a "flexible flow" manufacturing process capable of high-speed product customization, it found its workers confused by the system. Among those workers who volunteered to be tested, more than half could not read at all or read below the eighth-grade level.[11]

Item: New York Telephone had to interview 57,000 applicants in 1987 to find 2,100 capable of becoming phone operators and repair technicians.[12]

For companies like these, the workforce skill problem will get worse before it gets better. For one thing, the "baby boom" has passed and fewer young people will be entering the workforce in the coming decade. For another, those that do will come increasingly from minority and immigrant groups with significant educational handicaps. More important, these new workers will share with young people already out of school one important characteristic: the time they spend in public school will do little to prepare them for the world of work.

The United States sends a higher percentage of its secondary school graduates to college than any other industrialized nation.[13] It is the major path to the American Dream. For the 50 percent of our young people who leave school with a high school diploma or less, there are few viable paths to the future. Those with enough "staying power" to graduate will have spent four years taking courses that are undemanding, doing work that is theoretical rather than applied, and attending classes in a school year so short that it assures that secondary school graduates elsewhere will have one to two years more learning time than American youth. Many—20 percent nationwide and as many as 50 percent in some inner city neighborhoods—will simply drop out, and the school system will do little to encourage them to return.

With neither academic nor occupational skills of any real substance, America's non-college bound young people—called the "Forgotten Half" by two major national studies published by the William T. Grant Foundation in 1988[14] —are simply released to a labor market that has little to offer them and has little interest in what they learned in school. According to the Commission on the

Skills of the American Workforce, 90 percent of employers surveyed ignore high school diplomas, believing graduates to be no better qualified than dropouts, and 98 percent never examine high school transcripts, believing the coursework to be irrelevant to their needs.[15]

Poorly educated, unskilled, and unprepared for jobs with any kind of future, these young people drift from one low-wage job to the next well into their mid-20s. Some will complete their GED, others may enroll in vocational schools and community colleges. But beyond these modest steps, they have few opportunities to receive skill training once they leave school. Only one half of one percent of all employers provide worker training and only a handful invest more than two percent of their payroll on it. And most publicly-funded training is narrowly aimed at recently dislocated workers and targeted segments of the disadvantaged population. Training is seldom tied to industry standards (because few exist) and it is seldom organized in a manner that would lead to recognizable credentials.[16]

The Commission on the Skills of the American Workforce characterizes the prospects of America's non-college bound youth succinctly: "There is no curriculum to meet these youngsters' needs, no real employment service for those who go right to work, few guidance services for them, no certification of their accomplishment, no rewards in the work place for hard work in school, no sign of real respect. Virtually everything in their environment tells them that they are nothing. . ."[17]

School-To-Work: The Missing Link

America's high schoolers are not unfamiliar with the world of work. Sixty-six percent of all 12th graders were working in 1988.[19] But the school and work lives of these students are almost completely divorced—their work usually has nothing to do with what they learn in school, and what they learn in school has little to do with what is required of them at work. What's more, it's often the wrong kind of work: part-time service sector jobs that neither require nor develop sophisticated skills and offer little hope of a future. Ironically, the school-to-work linkages for those students who graduate from vocational programs are almost as tenuous: only 27 percent ever hold a job in the trade for which they trained.[20]

We're pretending if we worry that we are forcing kids to make choices. They're already making choices. They're dropping out.

Mary W. Roberts
Commissioner, Oregon Bureau of Labor and Industries

However short-sighted or destructive their decisions may appear to adults, the fact is that young people who drop out or fail to take high school seriously are making rational decisions, given the information available to them. They are isolated from work experiences that require proficiency in reading, writing, math, problem-solving, and active learning, and the work experiences to which they are exposed demand few, if any, such skills and do not reward those who possess them.

If a large percentage of America's youth succumb to the lures of the street, they do so, in large part, because society offers them little alternative. In the vast majority of American secondary schools, most of the educational and administrative energy is focused on the college-bound student. Teachers gear coursework

to college requirements, guidance counselors provide college counseling, colleges themselves visit schools and distribute glossy catalogues, and government at all levels provides substantial financial incentives for the college bound. There is no comparable array of information on non-college choices. Even by the most liberal calculations, the combined state, local and federal education and training investment on behalf of non-college bound youth is only approximately one-seventh of its investments for those who are college-bound.[21]

After an exhaustive review of prospects for non-college youth, the William T. Grant Foundation Commission on Work, Family and Citizenship concluded: ". . .our economy is being damaged and, more importantly, young lives are being damaged, by our collective failure to help young people make a smoother transition from school to work."[22]

The Youth Apprenticeship Alternative

Virtually all of our competitors have something like the German apprenticeship system; only the United States has nothing.

Stephen F. Hamilton
Cornell University

The United States is not alone among the industrialized nations in facing stiff economic competition from low-wage developing nations. But it *is* alone in facing that competition with a poorly trained workforce. Across Europe, but especially in Germanic and Scandinavian nations, strong universal programs—variations on the apprenticeship model—assure all young people an education that includes specific preparation for the world of work. At the same age that most American high school graduates (and dropouts) are cast adrift in the low-wage labor market, their European peers are already on their way up the career ladder in a skilled trade or profession. These systems—developed and operated jointly by employers, unions, educators, and governments ranging from Conservative to Social Democratic—respond to a simple economic fact of life the United States has yet to embrace:

> *Competing in an environment of high production costs requires products of exceptional quality; producing products of exceptional quality requires a highly skilled workforce.*

The Europeans achieve this condition by providing young people with a world-class basic education and assuring regular opportunities to learn about, and ultimately train for, specific careers. In the process, they turn schools into work places and work places into learning places.

Basic Education. Compulsory education in these countries demands high levels of achievement from all young people in the fundamentals (math, language, history, science, the arts). Those who have difficulty meeting these expectations get special help; indeed, in Sweden local governments are *legally* responsible for finding further training or work for dropouts and those who complete compulsory education but do not go on to upper secondary school. Throughout compulsory school students are exposed to the world of work through field trips and "work shadowing," in some cases as early as elementary school. Employers and labor market specialists visit the schools as young people reach their teens. By the time they complete secondary school at age 15 or 16 most of these young people will have had extensive

opportunities to explore potential careers. Moreover, their academic work in many cases will be designed to be directly relevant to the world outside the school.

Career Training. After completing compulsory school, most young people in northern Europe and Scandinavia enter a roughly three-year career preparation program. Ninety percent in Sweden, for example, enter noncompulsory "upper secondary school" and choose among some 30 broad "lines" of study, more than half "vocational." While the Swedish program is school-based, the curricula are developed with the help of employers and unions and students spend more and more time each year under an employer's supervision. The German system, in contrast, is company-based: more than two thirds of German school-leavers (and many college graduates) choose from among some 380 potential apprenticeships, sign a contract with an employer, and spend the next three years in training—working four days a week on-the-job under the eye of a master craftsman and the fifth day in a state-funded technical school. At the end of their apprenticeship they take a national examination and secure a certificate of mastery that is recognized throughout the nation and, increasingly, throughout Europe. Young people in all of these programs earn a modest wage (paid by the state in school-based programs, by employers in company-based programs) while pursuing their career training.

European Youth Apprenticeship: Essential Operating Principles

Successful European youth apprenticeship programs, whether the classic company-based system in Germany, Austria, and Switzerland or the modified school-based programs in Sweden and other Scandinavian countries, have in common several principles:[23]

1. *Every individual can make a contribution to the welfare of the community; work is the vehicle for that contribution and skill makes work possible.*

Human beings define their value to society, and therefore to themselves, in part by the work they do. A society that permits large numbers of people not to contribute—by letting them "fall through the cracks" of the educational and economic systems—impoverishes itself as much by denying them opportunities to contribute as it does by the high costs of maintaining them in jails or on public assistance. Apprenticeship-like programs present individuals of every level of ability opportunities to acquire skill, contribute to community well-being and, in the process, to find themselves as well.

2. *The key to producing a competitive workforce is a first-rate compulsory educational system with an explicit and significant work experience component.*

Compulsory education in these countries is academically demanding, but also carefully designed to provide structured exposure to work experiences. This component demonstrates to students the relevance of their academic studies, assures employers that new entrants to the labor force will understand the world of work, and helps the educational system to adapt to change in the real world,

Some people work with their hands, some with their mouths; but everybody works with his head.

William Raspberry
The Washington Post

keeping it fresh and current. How European nations make the connection between school and work varies with their experience and cultural traditions, but the commitment to high standards and work experience is absolute.

3. *Compulsory schooling cannot produce fully-prepared workers; everyone needs further training.*

Even Europe's best compulsory school systems don't expect their graduates to be fully prepared for the world of work. In every case, a post-compulsory school training system is in place to provide career preparation—an apprenticeship program, or a variation on the apprenticeship theme—that combines continuing academic and theoretical training with gradually increasing workplace training and responsibility.

4. *Post-compulsory school training must provide recognized, respected, and universally accepted credentials.*

The 1992 integration of markets for products and services has forced European countries to implement what in the U.S. is still a theoretical notion: the principle of "portable skills"—credentials that are universally recognized. Credentials are crucial not only to assure all citizens a variety of respected paths to a good future; they play a key role in demonstrating the quality—and competitiveness—of a nation's people and the products of their labor. The development of national standards and the certification of training providers is central to credential development.

5. *Creating an educated and skilled workforce requires genuine partnerships between business, labor, and governments.*

Not even the most centralized European government pretends that creating a highly skilled workforce can be accomplished by government action alone. In one form or another all of these programs are jointly conceived and executed by labor, business, and government. Whether company-based or school-based, business determines the content of training and helps to finance it; labor unions help define the process, by which the interests of both new and existing workers are protected, and government oversees both, linking them to the public education system. Where training systems work best, companies and unions have, after decades of tug and pull, come to view training expenditures as strategic investments in long-term competitiveness, not as business costs.

6. *Building workforce competence demands patience, experimentation, and long-term investment.*

Establishing first-rate education and training systems requires patient and cooperative planning, testing, evaluating, revising and scaling up to national coverage. This process assures that the interests of all participants are taken into account, that unity of purpose is achieved, and that a strong constituency is created to ensure long-term financial and political support. It also recognizes that, however diverse the population may be, only nationwide standards and a nationwide labor market system can guarantee that the competence objective will be reached.

7. *When workplaces are also learning places, organizations have greater capacity to become more flexible, efficient, and productive; economies have the potential for greater competitiveness.*

When companies are involved in apprenticeship-like programs, communication among workers, between workers and management, and between management and unions increases. As communication increases, opportunities to improve products and production processes increase as well. The combination of workers with high levels of skill and workplaces with high levels of communication creates the conditions under which high performance organizations can develop. When these conditions apply to thousands of small, medium, and large firms, as they do for example in Germany, economies have the potential for greater competitiveness.

The Tangible Benefits For Participants

The fact that competitiveness in a global economy requires an educated and highly skilled workforce is largely irrelevant to most people, young or old. Youth apprenticeship programs have succeeded in Europe not simply because they are good policy, but because they provide *tangible benefits for participants and for the community as a whole.*

Developing technical skills is important, but just as important are learning to take initiative, developing a sense of personal responsibility, making decisions, learning how to learn, loyalty to other people, to work, and to a company, and understanding the importance of quality.

Hans W. Decker
President,
Siemens USA

For Young People. When linked to a basic education system that provides exposure to the world of work early in life, apprenticeship-like career training systems give young people opportunities to explore a range of occupations and skills before they leave the learning environment. Not only does this help them begin to take control of their own futures, it also clarifies the relationship between what they study in school and what will be required of them when they enter the labor force and helps them choose courses more appropriately while still in school. But while providing a clear path to a specific trade or profession is an important goal of European apprenticeships, and the most obvious lure for the student, it may well be the least important one. For 16-year-olds, apprenticeship provides, in Stephen Hamilton's phrase, a "constructively ambiguous role appropriate to adolescence"—that of "worker/learner"—by which young people can broaden the base of their education in applied settings and mature gradually in the company of adults who care about them. While most American 16-year-olds cruise shopping malls in the company of their peers, German youth spend the majority of their time working and learning in the company of adults who serve as mentors, counselors, coaches, and trainers who encourage them to take responsibility for themselves and their work, develop personal initiative, solve problems, and work cooperatively with others.[24]

For Employers. The most obvious benefit of European apprenticeships for employers, who typically foot much of the cost, is that they have an opportunity to select employees whose personal characteristics and technical skills are known to them. European employers as a group believe that this system gives them a major competitive advantage over their foreign rivals, and productivity statistics bear them out.[25] There are more subtle but no less important benefits for employers as well. Their investment and participation gives them tangible influence over the content of secondary and vocational/technical school curricula and the substantive standards required for exams and certification,

further assuring that incoming workers will meet basic requirements for employment. In addition, the collaboration required between firms, unions, and government bodies, while it involves some trade-offs, helps to minimize conflicts that otherwise would sap productivity, and thus profitability.

For Unions. The benefits for unions are not dissimilar to those for employers. Unions play a key role in defining the work standards, wages, and benefits provided in firms training apprentices. This provides unions access to firms and workers, assures them a say in the rules governing apprenticeship, and gives them a constructive role to play in education and training policy. And because unions need to be as adaptable to changing economic conditions as firms, their constant dialogue with individual businesses and employers' organizations helps them ensure that their own demands meet the test of international competitiveness. Their objective, at its root, is ensuring fair wages for their members—a goal that can only be reached if firms, workers and unions—are competitive.

For Schools. Schools may benefit from apprenticeship-like systems as much as their students. Bringing the world of work into the school, while perhaps initially threatening, tends to enliven the educational process, invigorate teachers, and make students eager learners. It also has the potential of bringing fresh resources into the school; many European programs benefit from direct investment by businesses in faculty salaries, teaching materials, and physical plant and equipment.

For Communities. Communities may benefit most from what they *don't* get from youth apprenticeship systems: high levels of teenage crime, drug abuse, pregnancy, dropouts, and related social concerns. When all members of society have access to clear paths to good jobs with a future, the destructive behavior symptomatic of the absence of these opportunities declines sharply—as do the expenditures they require. Over the long term, better educated and trained young people become better citizens as adults, able to participate more actively in the life of the community and to contribute to the solution of its problems.

Diversity or Chaos? U.S. Youth Training Programs

If we consciously set out to design a system to encourage failure, the result would bear a striking similarity to what we have now.

Ray Marshall
Former Secretary of U.S. Department of Labor; Co-Chair, Commission on the Skills of the American Workforce

The United States is the only major industrialized nation without a formal system for helping young people make the transition from school to productive, skilled employment. In its place, the U.S. has a welter of education and training related programs that typically serve small and often marginal segments of the American labor force.

Secondary School Vocational Education. The public school system's ability to prepare people for work is the keystone to its cultural, economic, and political roles—and it is failing in that task for the very students most in need of work preparation. The nation's public and private elementary and secondary schools currently serve some 40 million students at a cost of $150 billion each year.[26] Nearly half of these students will go on to higher education and only half of *those* will gain college degrees and

have rewarding careers. The rest will try to enter the workforce, with varying degrees of success. Secondary schools also spend some $6.5 billion each year providing vocational education to about 5.5 million students.[27] Non-college-bound students often learn math and other academic skills best in applied learning situations and typically earn higher wages and experience lower levels of unemployment than students who do not take such courses.[28] Ironically, however, students entering the workforce directly from high school account for only about 25 percent of all secondary school vocational course credits; nearly half are accounted for by students headed for college. Less than one-eighth of general education students enter a job with any occupation-specific vocational training.[29] Moreover, those that do take such courses often find that the skills they learned are inadequate or outdated, limiting rather than enhancing their opportunities in the workplace.[30] In short, those students who might learn best by *doing*, rather than by manipulating symbols and abstract thoughts, are not being well-served by a system ostensibly designed for them.[31]

Post-Secondary Vocational Training. According to the U.S. Bureau of Labor Statistics, technical institutes and community colleges provided qualifying training for some 5 million workers and upgrading training to 3.3 million more in 1985.[32] But these institutions, while presenting an increasingly innovative range of courses to meet labor market needs, primarily serve adults, not young people. The average age of students is 29. Many of the younger people who are enrolled in these schools will go on to a four-year institution; they are not, by and large, workforce-bound. Moreover, a high percentage of young people attending community colleges will drop-out before they receive a post-secondary degree or certificate.

In addition, there are a wide range of private, noncollegiate vocational schools that, according to the Bureau of Labor Statistics, provided qualifying training for some 3.7 million workers and upgrading training for 1.6 million others in 1985.[33] While many of these schools train students effectively and place them with employers, the system is widely criticized as rife with abuses, attracting students who qualify for federal loans, training them inadequately, failing to place them in employment relevant to their training and, in the process, precipitating high levels of student loan defaults.[34]

Finally, a variety of private nonprofit training organizations have been spawned by the Job Training Partnership Act (JTPA), Aid To Families With Dependent Children (AFDC), and the Work Incentive (WIN) Program. Aimed at the unemployed, the working poor, dislocated workers, single mothers on welfare, dropouts, and others marginal to the labor force, these programs are aimed principally at redressing social and economic inequities and redistributing income, rather than training young people.[35] Like their public and private counterparts, these programs primarily serve adults.

Apprenticeship. In 1989, there were 1.7 million young people apprenticing with a half million employers in West Germany.[36] In the United States, with four times as many people, there were only 263,000 registered apprentices in 1989.[37] The difference is that

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While West German apprenticeships are an integral part of the school-to-work transition for youth, American apprenticeships are a vehicle for training a limited number of adults for a limited number of openings for skilled tradesmen. While more than two-thirds of all West German youth enter apprenticeships, fewer than two percent of U.S. high school graduates do the same.[38] The average age of U.S. apprentices is in the mid-20s;[39] few are minorities, even fewer are women. Over 60 percent of registered apprentices in 1988 were in building trades, mostly unionized, and 40 percent were in just three trades: carpentry, electrical, and pipefitting.[40] While joint labor-management apprenticeships in the U.S. train their graduates well, they simply do not reach sufficiently large numbers of young people. Moreover, except in a handful of trades, U.S. employers cannot rely on the standards of training for apprenticeships to be uniform nationwide; most are locally-developed.[41]

U.S. School-to-Work Experiments. In the face of the failure of conventional education and training systems to serve the needs of workforce-bound American youth, schools, foundations, corporations, and state and federal government have initiated an array of demonstration projects designed to explore several school-to-work options. Some make work part of the learning experience, others combine academic and vocational studies within the high school curriculum.[42]

There are currently some 1,500 high school students involved in **school-to-apprenticeship** programs that permit students to become registered apprentices while they complete high school.[43] Begun in the 1970s as pilot programs at eight sites around the country, outcomes from these demonstrations have been positive for students, schools, and employers. But the program has never been expanded beyond the pilot stage. Individual schools in individual school districts around the country are experimenting with "pre-apprenticeship" programs designed to encourage at-risk students to stay in school, but there is no coherent pattern and results are spotty.

Close to a million students each year enroll in **cooperative education** (or "co-op") programs in high schools and, to a lesser extent, two-year colleges. A variation on the work-based learning theme, co-ops are agreements between a school and a cooperating employer to provide on-the-job training related to a student's program of study in school, based on objectives the school and employer work out together. Students are supervised by their employer while at work and employers are monitored by the teachers who recruited them. Theoretically, the co-op approach presents opportunities similar to apprenticeship: a chance to connect school studies with work requirements (thereby reducing dropouts), try potential career options, develop relationships with employer/mentors, and earn money constructively while paving a route to future employment. But while researchers have found secondary co-op students to be more satisfied with school, their job and earnings prospects do not appear to be significantly better than non-co-op students.[44] Moreover, while they benefit from some federal funding support, there are no national standards either for the organization or the content of co-op programs.

incentives for employers to cooperate, monitoring is uneven, and there is no way of judging what, if any, real benefits are gained by participating students. Even more important, co-op programs have little effect on classroom curricula and therefore simply reinforce the gap between the worlds of work and school.

School-based enterprises—such as school restaurants and stores, print shops, farms, child care centers, hair styling, auto repair shops, construction programs—have been created in hundreds of high schools around the country. Generally, they serve four purposes: to teach entrepreneurship, provide opportunities for applying knowledge taught in class, enhance students' personal development, and/or stimulate community economic development.[45] Such enterprises may be located in-school, in free-standing locations in the community, or in separate schools or facilities created for the purpose to which students are transported. Their utility for work-based learning depends upon genuine modification of curricula to connect learning with doing, sufficient school or community resources for establishing viable enterprises, substantive knowledge of the business by participating faculty, supervisors focused as much upon skill-building as profit-making, and continuity year-to-year. However, while school-based enterprises can provide valuable skill-building opportunities for those involved, they make no direct connection between students and business owners, typically involve only a small minority of the school population only part of the time and, in the words of Professor David Stern, "seem to exist all around the edge of the educational system, but not to affect its basic structure."[46]

Begun in Philadelphia in 1969 but expanded today to over 100 locations around the country, secondary school **academies** provide at-risk students an opportunity to combine academic coursework with vocational training. Academies are typically organized as "schools-within-a-school" that give special attention to students with a high risk of dropping out. They focus on a specific field (e.g. health, electronics, business), building field-specific vocational courses around a core of academic courses. Finally, they forge direct links between school and the world of work by involving local employers who participate in curriculum design, donate equipment, provide after-school and summer jobs, and serve as mentors. Evaluations of academy programs suggest that participating students have lower dropout rates, higher graduation rates, high subsequent earnings, and a higher likelihood of going on to further education than non-academy students with similar school records.[47] Despite these apparent benefits, academies are not widespread and, where they exist, typically serve only a small minority of students in participating schools.

In an independent response to a perceived decline in the work-readiness of high school graduates, companies in communities throughout the country began developing **business-school partnerships** during the 1980s. Some were targeted directly to individual students, some "adopted" schools, and others (like the Boston Compact) addressed entire school districts. In all three forms, students are promised part-time or summer jobs in return

for achieving certain standards of attendance and academic performance.[48] But such programs typically do nothing to change the content or structure of secondary education to improve the school-to-work transition and there is seldom any direct relationship between the jobs offered as incentives and the courses participating students take in school, though proponents of such partnerships have begun to move in this direction. Finally, as with other experiments, school-business partnerships are strictly localized phenomena, affecting a tiny minority of American secondary school students.

Perhaps the most comprehensive effort to integrate vocational and academic studies to produce more "work-ready" workers has been the **tech-prep** movement. Specific forms vary from "2+2" programs (junior and senior year plus community college, often called "post-10 options"), and "4+2" programs (high school and community college), to "2+2+2" programs (junior and senior year, community college, last two years of four-year college). Designed to make technology-based vocational education as attractive as traditional college-prep courses and to make secondary education more meaningful to students who might otherwise become disaffected, tech-prep programs are the most thorough approach to restructuring public school curricula currently underway in the United States. There were 122 tech-prep programs in 33 states as of June 1990; three states have mandated the creation of tech-prep programs and six more are considering doing so.[49] Not unlike the Swedish upper secondary school system, tech-preps are explicitly designed to provide the math, science, communications, and technology skills likely to be required in the coming decades. An evaluation in Minnesota suggests that tech-prep students outperform regular students in post-secondary institutions.[50] But *unlike* the Swedish model, tech-prep programs to date have had few formal linkages with the business community in the design of curricula, and do not offer work-based learning opportunities or paid employment; they are almost exclusively school-driven. Finally, as with other school-to-work transition experiments, tech-prep programs are isolated pockets of innovation; to date, their effect on the structure and delivery of secondary school education nationwide is limited.

Does it matter that mainstream American secondary education is unconnected to the world of work and the demands of an increasingly competitive global economy? As the Commission on the Skills of the American Workforce has concluded, the absence of a youth employment training system has not created a shortage of skilled workers for the jobs that currently exist—because most American employers have yet to recognize the skill challenge facing them. But it *has* created a shortage of skills required in the kinds of jobs that must be created in much larger numbers if the nation's economy is to regain its competitive edge.[51] Perhaps as important for American society, the absence of such a system creates a significant obstacle for the majority of young Americans who lack a college education and seek satisfying work that enables them to feed, house, and maintain a family.

Youth Apprenticeship, American Style

There is growing interest in the United States in developing a national system for preparing young people for skilled, high-wage careers through a coherent combination of classroom and workplace learning. There is no shortage of pilot projects attempting, to one extent or another, to achieve this objective. Gradually, however, a consensus is emerging that **youth apprenticeship,** structured to meet the unique conditions of the American labor market, may be one of the most attractive options. At its simplest, youth apprenticeship—American style—is:

> *a systematic mix of academic instruction in secondary and post-secondary schools with employment-based training for students—at a level of quality sufficient to certify the ability of individuals to perform entry-level tasks in skilled occupations capably and professionally.*

Analysis of the operation of European apprenticeship-like systems, the unique cultural, social, and economic conditions in the United States, and the strengths and weaknesses of existing local programs designed to improve the school-to-work transition in America suggests several *basic premises upon which any American-style youth apprenticeship system must be based:*

- *It must recognize and accommodate the diversity inherent in the American populace;*
- *It must be part of a broad effort to improve the linkages between the world of work and the world of high school, and not just for those who are not college-bound;*
- *It must provide early exposure to work experiences and genuine opportunities for workplace learning, with training wages paid by employers;*
- *It must result in formal, universally-recognized credentials that meet nationwide standards that are the product of the collaboration of government, education and labor agencies, union representatives, and business associations;*
- *It must assure apprentices opportunities to go on to further education, should they seek it, after receiving their apprenticeship credentials;*
- *It must encourage lifelong skill-building.*

What might such a system look like? One analyst suggests this scenario: Between 7th and 9th grades, possibly earlier, students would begin to explore a wide range of occupations and careers, through site visits, work "shadowing," job sampling, and employer visits to school. In the process they would begin to learn the kinds of skills that will be required of them when they finish school.

In the 10th grade, students begin to receive career counseling, interview employers, and seek apprenticeship openings, though some may opt for a purely academic track. Students and employers would sign apprenticeship contracts by the end of the school year.

During the 11th and 12th grades, students would spend part of each day (or week) in school studying academic courses crafted explicitly to be relevant to the world of work, as well as technical

Watching and imitating is how children make their way into adulthood... apprenticing youngsters to masters is founded on this fact of life.

Christopher Cross
Assistant U.S. Secretary of Education for Educational Research and Improvement

In order to increase access, teach basic skills, and use work-related structures, we need to evolve a system in this country that is truly an American-styled apprenticeship and school to work system.

Roberts T. Jones
Assistant U.S. Secretary of Labor for Employment and Training

and occupational courses relevant to their chosen field. They would also spend time learning on-the-job under the guidance of a certified workplace instructor. Workplace learning would increase gradually from 30 percent to perhaps 75 percent of the day (or week) as they moved toward completion of 12th grade. At that point they would take an interim examination qualifying them for their high school diploma and permitting them to continue to the third year of their program.[52]

During the third year, they would pursue further education at nearby community colleges, but would spend the bulk of their time at the worksite developing their skills in preparation for their final certification examination. Having passed the exam, they could choose to remain as employees with their current employer, pursue further technical or academic education, or take their credentials with them to work with another firm elsewhere in the country.

The benefits of such a *national youth apprenticeship system*—as distinct from a welter of well-intentioned pilot programs—are tangible and substantial: a growing supply of skilled workers; increased productivity and higher wages for non-college workers and a corresponding reduction in America's growing income gap; promising careers for all young people, not just the college-bound; and a reduction in the social and economic consequences of our failing current system—dropouts, youth unemployment and underemployment, substance abuse, teen pregnancy and welfare dependency.[53]

Changing The Status Quo: Issues and Tentative Answers

The world has changed but our learning systems have not... In the old world people with a limited education could earn a living, today they cannot.

Ray Marshall
Former Secretary of U.S. Department of Labor; Co-Chair, Commission on the Skills of the American Workforce

Despite the tangible benefits, opposition to change in the status quo is predictable, even understandable. Establishing an American youth apprenticeship system would require major shifts in the way Americans think about education, careers, and themselves.

Businesses would have to view training young people as an investment crucial to their own long-term survival. Schools would have to acknowledge the importance of work-relevant education and training and respect the aspirations of young people who want to enter the workforce directly from high school. Teachers and school administrators would have to relinquish some control over curriculum content and teaching methods to employers and union specialists. Unions would have to accept, as their European colleagues have, a training wage for student apprentices that reflects their learner status. Government officials would have to commit to investments in technical assistance, monitoring, and testing. Parents and the community as a whole would have to recognize that national technical credentials are as valid as a college degree as proof of an individual's ability and value to society. And students would have to learn that school is a place to prepare for the responsibilities of adulthood, not a place to avoid them.[54]

Before an American youth apprenticeship system can be established, several important questions will have to be addressed. Here are some of the most common concerns—and responses provided by some advocates of youth apprenticeship:

1. *Does it makes sense to produce better-qualified workers w*
employers have no use for them? This is the essential "chi
egg" issue. We know that, at present, most employers
have no skill shortage. We also know that, if they are t
without lowering wage rates to the level of the Philipp
businesses will have to become more productive and t
can only do this by reorganizing production and usin
trained workers. The problem is hardly a novel one: m
European competitors—Sweden, Denmark, northern
Britain—faced the same dilemma. They resolved it by
the quality of workers, thus *enabling* change in the sys
duction. Investment in the former must precede prog
the latter.

2. *If most companies see no skill shortage, how can we exp*
finance the cost of apprenticeship training? First, employe
not be expected to bear the entire cost of apprenticesh
ments and school systems will be expected to redirect
investments in both academic and vocational educati
a restructuring of public education. Second, helping
understand the immediacy of the skill challenge clear
require a major educational effort, perhaps led by inc
ciations. The business component of the financing iss
handled by most of our competitor nations through a
ranging from 1 to 3.5 percent of payroll. (Creating suc
ing pool also overcomes the problem of small firms b
to provide the same level of training investment as la
tions.) The fact that the payment is required acts as a
firms to think carefully about their training needs an
overcome the "chicken and egg" problem. In additio
mission on the Skills of the American Workforce has
variety of incentives to encourage employers to help
apprenticeship system.[55]

3. *Won't apprenticeship narrow students' educational exp*
leaving them with skills that will rapidly become obsolete?
from our competitor nations suggests otherwise. Firs
are developed jointly with employers and unions an
continuously. Second, they aim to provide broad ski
limited to a specific trade. Moreover, workplace learn
to increase students' enthusiasm for the academic co
study, not just the work-related courses. Finally, beca
ticeships deal as much with how to work and learn a
with training specific skills, apprentices are sought a
employers regardless of their specialty.

4. *Doesn't any youth apprenticeship program represent a*
''tracking'' for those students unable or unwilling to go on
effect, providing education for the privileged and training f
privileged? American education purports to be democ
reality is that children are tracked from the day they
garten. Some 50 percent of our young people are trac
through primary and secondary school and then sim
out into the world of work without the skills to survi
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and unwanted pregnancy, substance abuse, and crim
are both product and evidence of the existence of the
Among our competitor nations, apprenticeship-like

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many opportunities for youth to move between general and college-prep courses, before and after entering apprenticeship. There is no reason why similar routes of mobility could not be designed into an American system. So highly valued is an apprenticeship in Germany, in fact, that many college graduates subsequently enter apprenticeship training in their field of interest. In the U.S., youth apprenticeship programs can combine opportunities for both occupational and post-secondary academic advancement.

5. *Is it reasonable to expect 10th graders to make career choices?* We already permit them to make life choices in the 10th grade—and our young people are making the wrong choices. Many drop out at this stage. Many more simply give up on education and "mark time" for the next two years before drifting into the labor market after graduation, unskilled and unprepared. Others commit themselves to their studies, aware that their last two years of high school will be important for getting into the "right" schools. The problem isn't making choices, it is making *informed* choices. An educational system more closely tied to the world of work will provide 10th graders better information upon which to make the choices they already are making.

6. *How can youth apprenticeship compete with the paid part-time work young people are already doing?* First, apprentices should be paid—at a rate commensurate with their status as learners. Second, if schools, businesses, and unions do a good job of designing programs that provide clear paths to good jobs with good futures, young people will make the right choice. Again, the experience elsewhere in the industrialized world is not only that this is possible, but that it is the norm.

7. *How would such a system accommodate the differences in technical sophistication and training ability of small and large firms?* Several nations which already provide apprenticeship-like programs have economies composed primarily of small firms. To adjust to their limited training capacity, these nations have either created free-standing training schools supported financially by small firms or provided small firms and their associations with incentives to form training networks and service centers of their own, capable of providing the same range of opportunity to trainees as they might have in large firms. There is no reason why similar arrangements could not be made in the U.S., building perhaps on the existing system of technical and vocational training centers.

8. *A vocational education has low social status in the U.S.; how could youth apprenticeship change that?* Vocational education has low status in large part because it is viewed, especially by many employers, as poorly connected to the demands of the real labor market. It has low status, in effect, where it has low real value. By creating a system that is employer and labor market driven, rather than school driven, the problem of irrelevance can be eliminated and both the quality and the real value of a technical career will be enhanced. Graduates will be valued, and gain status, because their skills are valuable.

9. *Skill development makes sense in a period of labor shortages, but what happens when the business cycle turns downward? How do you keep employers investing in training and assure graduates jobs when they complete training?* Again, this is not a novel problem: the Japanese increase their long-term investments during downturns to improve competitiveness when the economy heats up again. German employers came to an agreement with unions and government to guarantee apprenticeship places even during recessions, in part so they could continue to be the principal determinants of training content. Sweden provides public service and public works employment to workers and encourages them to use downturns as training opportunities. The chief difference is whether a nation makes economic decisions on the basis of short-term or long-term returns on investment. Our competitors focus on the long-term when addressing human resource issues; we must learn to do the same.

Toward A Skilled Society

Our economy—indeed our society—is simply a composite of the skills, aspirations, and dreams of our people. If our skills deteriorate, our dreams will be impoverished. Arkansas Governor Bill Clinton, one of the nation's governors at last year's "Education Summit" with President Bush, concludes: "If we wish to preserve the American dream of opportunity and bring disadvantaged Americans into the mainstream, we must create a system in which everyone can win." Most Americans are not now winning. With skills inadequate in a globalizing economy, the real income of nearly three-quarters of all Americans is declining and, for the first time in our history, we cannot offer our children the promise of a better life than their parents had. The only way we can reverse this decline is to provide America's young people the opportunity to increase their ability to learn, earn, and contribute to the welfare of our society throughout their lives. Our current education and training system does not provide that opportunity. Youth apprenticeship can. It is important not just in educational and economic terms, but as part of a strategy for bringing Americans together again around fundamental values: learning, working, caring, and giving.

What you buy when you buy a product is nothing more than the incarnation of human effort and skill.

Hans W. Decker
President
Siemens USA

Footnotes

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Appendix A

Youth Apprenticeship: Technical Assistance Resources

Prepared by Jobs For the Future

Work-based Learning

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Appendix B

Youth Apprenticeship: A Bibliography

Prepared by Jobs For the Future

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Introduction: Education and Work in a Changing Society

The United States, along with other industrialized nations, has witnessed dramatic social and economic changes in the last two decades. Since 1969, real average weekly earnings in the U.S. have fallen by more than 12 percent. At the same time, productivity growth has slowed by almost fifty percent. Greater efforts must be directed towards improving education and training opportunities for those who at present leave the system without adequate qualifications. The consensus emerging among policy analysts both in the U.S. and overseas is that, for the future, both personal well-being and national prosperity will depend on the development of more highly skilled workers and the adoption of new forms of work organization.

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The Target Group: Non-College Bound Youth

Dale Parnell focuses on "the neglected majority" and the William T. Grant Foundation Commission speaks of "the forgotten half." In 1988 there were 32.9 million young people aged 16–24 in the U.S. Before age 25, just under half of this cohort (15.8m) will have spent some time in college, while 17.1 million will not. Among these, about two-thirds will finish high school, and the remaining one-third (5.5m) will drop out. While the demand for college educated workers is growing, we are witnessing a decline in the overall size of the upcoming youth cohort, and an increase in the proportions of young people from low income and minority families. Citations in this section examine the problems facing non-college-bound youth and argue that there is an urgent need for both school reform and improved strategies for school-to-work transition.

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The Personal Cost of Insufficient Education

Young people with high-school qualifications or less are increasingly locked into low-wage jobs with poor prospects for future advancement. Unemployment and part-time employment among high school graduates is substantially greater than it is among college graduates. Jobs available to high school graduates are poorly paid in comparison with those available to college graduates, and the wage gap between college and high school educated workers has grown much wider over the last fifteen years. In addition, as Hong Tan's study shows, the likelihood that a worker will receive further training on the job is strongly related to the amount of education the worker already has: in other words, those with education get more, while those with little do not.

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The Economic Cost of Low Workforce Skills

A growing number of experts now argue that the inadequate skill levels of the U.S. workforce may adversely affect technological advancement and economic prosperity. If emerging demographic patterns persist, and if the relationship between poverty, minority status, and low educational achievement does not change, the next generation of workers will be one in which an increasing proportion has low skill levels. Just as the economy is requiring higher levels of skill from its new entrants, the absolute numbers of people reaching working age is declining and the proportion of them from backgrounds traditionally associated with low levels of cognitive skill and educational achievement is increasing.

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Prais, Sig J. *et al.* (1981). *Productivity and Industrial Structure: A Statistical Study of Manufacturing Industry in Britain, Germany and the United States.* New York: Cambridge University Press.

Are Workplace Skill Requirements Changing?

As Bureau of Labor Statistics data show, throughout this century there has been a clear, long-term increase in workforce skill requirements. This process has accelerated in recent years: between 1976 and 1988, higher-skilled occupations grew at almost three times the rate of lower-skilled jobs. In fact, for the first time in our history, a majority of all new jobs during the next decade will require some form of post-secondary education.

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The State of Our Schools and the Need for Reform

American education is in need of substantial reform because the world has changed while our schools have not. Despite diverse opinions about what is to be done, one assessment is emerging with surprising unanimity: American schools urgently need to overhaul the academic content of the curriculum. As the evidence on international assessments of student performance suggests, American schools do a poor job of engaging most students in serious academic learning.

At the same time, thoughtful analysts argue that pressure for a simple "return to the basics" reflects the needs of a bygone era. How can we get from where we are—essentially knowing how to teach routine tasks—to a place where a majority of teachers are able to engage students in active problem solving and foster deeper conceptual understandings of the core academic disciplines? The answer, according to most reformers, involves simultaneously

changing the way teachers are educated, the way schools are managed, and the relationship between research and the practice of teaching.

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The Rationale for Linking School and Work

School Reform in a Changing Economy

As Bailey, Zuboff and others have shown, the introduction of new technologies and new forms of work organization in a wide range of occupations is transforming the level of skill demanded of front-line workers. Berryman contends that these changes are blurring the division between "head" and "hand" in the modern workplace. She argues that, as this happens, the differentiation of the curriculum into "academic" and "technical" becomes more and more questionable. Students in the vocational tracks now have an

equal need to acquire the higher-order thinking skills that were once considered essential only for students in the academic tracks.

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Improving the Transition From School to Work

Support for closer integration of schools and workplaces comes from a number of sources. From different standpoints, educators, sociologists, and economists all argue that closer school-work relationships could be used to increase the relevance of the high school curriculum, enhance student motivation, and improve the transition from school to work. Many young people "bounce around" for several years in the process of finding a good job. There is a growing consensus among researchers that better-structured relationships between schools, colleges and workplaces are needed to address this problem.

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A Cognitive Science Perspective on Integrated Learning

Recent cognitive research has demonstrated that the quality of cognitive performance frequently depends on the context in which the performance occurs. For example, people who routinely perform intellectually complex tasks in everyday work settings are often unable to demonstrate their mastery of the same tasks if those tasks are presented in the form of pencil and paper tests. It has also been shown that learning which is "situated" in practical work-related contexts is both faster and more effective than learning which is purely classroom-based and unrelated to the contexts in which it is to be applied.

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School Improvement Through Business Partnerships

Corporate support for education takes many forms. For example, the Adopt-a-School movement and job incentive programs such as the Boston Compact involve partnerships between schools and enterprises which can be valuable politically, financially, and in other ways. Sometimes these programs provide incentives for curriculum reform, but this is usually not the central objective. The following literature provides an overview of school-business partnerships, but excludes publications on work-based learning, which are covered in a later section.

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Vocational Education and its Reform

Vocational education has always occupied an uneasy place in the United States education system. Many argue that vocational education is a "trap" rather than a "bridge" and that we do a disservice to young people if we track them into narrowly vocational options during their high school years. On the other hand, there is some evidence which suggests that minority and disadvantaged students who are enrolled in vocational courses are more likely to finish high school and less likely to drop out than disadvantaged students enrolled in the general track. Although different studies in this area tend to produce conflicting results, there is clear agreement on the need for more realistic linkages between vocational education and the workplace.

Recent reauthorization of the Carl D. Perkins Vocational Education Act contains two central reform initiatives. The first, known as Tech Prep, is designed to coordinate vocational education programs offered at the secondary and post-secondary education levels. Essentially, it aims to achieve substantial articulation between high school and community college courses. The second

initiative, referred to as vocational-academic integration, recommends a number of different approaches to upgrading the quality of academic learning in the context of vocational education.

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Schooling and Work: Lessons From Overseas

As the real wages and living standards of American families decline, policy makers want to know what is different about those advanced industrial countries where real wages are growing and high rates of productivity growth have been maintained. One thing that countries such as Germany, Japan and Sweden have in common is a strong commitment to maintaining coherent structures for the education and training of their workforce. Studies of these systems warn us that any attempt to adopt the German dual system or the Japanese model "whole-cloth" would be futile. Nevertheless, there are important lessons to learn, and some important principles of international best practice have been identified.

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Work-Based Learning: Current Practice, Future Prospects

Experiments with and interest in the youth apprenticeship model draw on the analysis and lessons presented in much of the literature cited above. In youth apprenticeship, there is a commitment to: developing academic knowledge in practical, work-related contexts; articulating school and workplace learning; and, at the same time, coordinating high school courses with vocational studies at the community college level. It can be thought of as a combination of the 2+2 model, paid employment during the school year in one's chosen field, and a pedagogy that stresses contextual, situated learning in both the classroom and the work site. There is already in this country a significant body of experience with work-based learning and efforts to integrate school and work more closely. Today's—and tomorrow's—youth apprenticeship efforts can build on knowledge, experience, and learning that has preceded. This final bibliographic section includes literature on the practice and the promise, the reality and the vision, of youth apprenticeship and, more broadly, school-and-work learning in the United States.

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Appendix C

Youth Apprenticeship: Quality School-and-Work Programs

Prepared by Jobs for the Future

This review of quality school-and-work connection programs is broad. It is intended to highlight exemplary programs not only in youth apprenticeship narrowly defined, but also in areas of activity which can inform policymakers and practitioners exploring the applicability of youth apprenticeship models.

This list is not exhaustive. No effort has been made to evaluate these programs. This list consists of programs that have been reported to Jobs for the Future as exemplary by education and training practitioners and policymakers. It should be seen as a good starting point for further inquiry.

The following pages describe projects grouped in four general categories:

1. School-to-Work Demonstrations Funded by U.S. Department of Labor
2. Youth Apprenticeship and Work-based Learning Programs
3. High School Academies
4. Career Awareness and Career Preparation Programs

School-to-Work Demonstration Projects Funded by the U.S. Department of Labor

In September 1990, The Department of Labor awarded $3.2 million in seed money for a program designed to help change the way U.S. students learn basic workplace skills. The following organizations were awarded two-year grants to explore the redesign of school curricula so that students learn job-related subjects in a practical context and are thus better prepared to enter the work force. Each of these projects involves the encouragement of work-based learning strategies for preparing young people for high-skill careers. Most are still in the design and development phase.

Boston: Project ProTech

Site: Boston high schools and Bunker Hill Community College
Target Population: Juniors and seniors
Occupation: Allied health
Employer(s): Area hospitals
Start Date: September 1991

Contact: George Moriarty, Associate Director, Youth Programs, Boston Private Industry Council, 2 Oliver Street, 9th floor, Boston, MA 02109. (617) 423-3755.

Los Angeles: Workforce L.A. Youth Academy

Site: South Central, East L.A. schools
Target Population: Focus on those interested in careers after high school
Occupation: Utilities, banking, telecommunications
Employer(s): Dept. of Water and Power, Security Pacific Bank, Pacific Bell
Start Date: 1990

Contact: John Perry, Specialist, Program Development, 1320 West 3rd Street, Room 806, Los Angeles, CA 90017. (213) 625-6850.

Passaic County, New Jersey: Electronics Industry Foundation

Site: Passaic County Technical and Vocational High School
Target Population: At-risk juniors and seniors
Occupation: Electronic technicians
Employer(s): Electronics companies (e.g. Matsushita)
Start Date: October 1990

Contact: Joseph Sterling, Director of Youth Programs, Electronic Industries Foundation, 1901 Pennsylvania Avenue, N.W., Washington, D.C. 20006. (202) 955-5810.

Pennsylvania: Metalworking Youth Apprenticeship Program

Site: Four sites: the regions of Pittsburgh, Philadelphia, Meadville/Erie and Lancaster/York
Target Population: Beginning in junior year
Occupation: Metalworking
Employer(s): Both large and small metalworking shops in each region
Start Date: September 1991

Contact: Susan Sanabria, Project Manager, c/o MANTEC, PO Box 5046, York, PA 17405. (717) 843-2898.

Washington, D.C.: National Alliance of Business

DuPage County, Illinois: Appliance Repair Technician Program

Site: 22 high schools in the county
Target Population: Juniors and seniors, including at-risk youth
Occupation: Appliance repair technicians
Employer(s): Sears, Roebuck & Company, Product Services (SPS)
Start Date: January 1991

Contact: Tana Petrich, Regional Representative, National Alliance of Business Midwest Office, 11 East Adams Street, Suite 1008, Chicago, IL 60603. (312) 341-9766.

San Francisco: Banking on Education Program

Site: Mission High School and two others to be determined
Target Population: Wide range of students starting sophomore year
Occupation: Anticipating varied occupations
Employer(s): Bank of America and at least two others to be determined
Start Date: The first 16 students (all seniors) were enrolled April 1990

Contact: Cindy Fisher, Director of Human Resources, Bank of America, 1 South Van Ness Avenue, San Francisco, CA 94103. (415) 241-3214.

Maryland: Department of Economic and Employment Development

Baltimore County: Project Mechtech

Site: Catonsville Community College
Target Population: Students at Murgenthaler High School
Occupation: Manufacturing technology
Employer(s): Twelve small to mid-sized firms in the machining manufacturing industry
Start Date: September 1990

Contact: Vernon Thompson, Director of Contracts and Operations, 1100 North Eutaw Street, Room 310, Baltimore, MD 21201. (301) 333-7650.

Carroll County: Maryland's Tomorrow

Site: Carroll County
Target Population: At-risk youth in dropout prevention program
Employer(s): Local businesses in a range of occupations
Start Date: 1990

Contact: Vernon Thompson, Director of Contracts and Operations, 1100 North Eutaw Street, Room 310, Baltimore, MD 21201. (301) 333-7650.

Southern Maryland: Tech Prep Plus

Site: Consortium of Calvert, Charles and St. Mary County school systems and Charles Community College
Target Population: All high school students in three clusters: Engineering Technology, Business Technology, Health and Human Services
Employer(s): Advisory groups forming in each county
Start Date: Fall 1991 for incoming 9th graders

Contact: Ann Smith, Dean of Career and Technical Education, Charles County Community College, PO Box 910, LaPlata, MD 20646. (301) 934-2251 x438.

Youth Apprenticeship and Work-Based Learning Programs

This section contains descriptions of a range of programs that incorporate many of the elements of youth apprenticeship. In particular, these programs provide paid employment to students during the school year, structure learning and training into the work experience, and use curricular materials and learning strategies that build and reflect upon student's job experiences. This list is representative, not exhaustive. Several of these projects are in the design stage; some are pilot efforts; others have been in existence for many years.

Battle Creek, Michigan: School-to-Apprenticeship Program

Site: Battle Creek high schools and area vocational center
Target Population: Juniors and seniors, college prep and vocational
Employer(s): Aviation Specialists, Kellogg Company, Eaton Manufacturing
Start Date: 1980

Contact: Harry Ward, Director, Calhoun Area Vocational Center, 475 East Roosevelt, Battle Creek, MI 49017. (616) 968-2271.

Boston: Fenway Children's Hospital Collaborative

Site: Bunker Hill Community College
Target Population: Juniors and seniors
Occupation: Health
Employer(s): Children's Hospital
Start Date: 1987

Contact: Larry Myatt, Director, Fenway Program, Bunker Hill Community College, New Rutherford Avenue, Boston, MA 02129. (617) 242-9095.

Broome County, New York: Youth Apprenticeship Demonstration Project

Site: Three to four school districts in Broome County and Broome Community College
Target Population: High school juniors through two years of community college
Occupation: Health care, manufacturing, financial services
Employer(s): Range of employers in the above industries
Start Date: September, 1991

Contact: Stephen Hamilton, Associate Professor, Department of Human Development and Family Studies, G-57 Martha Van Rensselaer, Cornell University, Ithaca, NY 14853. (607) 255-2535.

Cambridge, Massachusetts: Cambridge-Polaroid Partnership

Site: Polaroid Corporation
Target Population: Juniors and seniors, with emphasis on minority and female recruitment
Occupation: Photoprocessing, Imaging, others
Employer(s): Polaroid Corporation
Start Date: 1991

Contact: Larry Rosenstock, Executive Director of Occupational Education, Cambridge Rindge and Latin School, 459 Broadway, Cambridge, MA 02138. (617) 349-6753.

Central Massachusetts: Project Coffee

Site: 21 regional high schools within 40 mile radius of Worcester County
Target Population: Former high school dropouts
Employer(s): Digital Equipment Corporation, McDonalds, area factories
Start Date: 1979

Contact: Sean Gilrein, Executive Director, High School Annex, Carbuncle Road, Oxford, MA 01540. (508) 987-2463.

Chapel Hill: REAL Enterprises Federation

Site: Chapel Hill high schools
Target Population: Any student interested in becoming an entrepreneur
Occupation: Chosen by students
Employer(s): Small Business Development Centers assist students
Start Date: 1984

Contact: Dr. Paul DeLargy, Director, REAL Enterprises Information Services, P.O.Box 1643, Athens, GA 30603. (404) 546-9061.

Chicago: Chicago Career Preparation Initiative

Site: Chicago high schools and community colleges
Target Population: High school students; out-of-school youth; adults
Employer(s): Firms in financial services and manufacturing technologies/ metalworking
Start Date: January 1991

Contact: Sandra Fillion Foster, Executive Director, Productive Chicago, 226 West Jackson Boulevard, Room 1422, Chicago, IL 60606-6996 (312) 855-8082.

Cincinnati: School-To-Apprenticeship Program

Site: Great Oaks High School, Cincinnati, Ohio
Target Population: Seniors
Start Date: 1980
Employer(s): General Electric, small companies in area

Contact: Harold McIntyre, Supervisor, Apprenticeship Programs, 3254 East Kemper Road, Cincinnati, OH 45241. (513) 771-8840.

Michigan: Career Prep

Site: Jackson, Kent and Wayne County high schools and community colleges
Target Population: Juniors and seniors
Occupations: Manufacturing, health care, business services
Start date: June 1991 projected

Contact: Paula Stark, Policy Consultant, Michigan Department of Education, PO Box 30008, Lansing, MI 48909. (507) 335-4322.

Phoenix: Industrial Education Program

Site: 24 high schools in and around Phoenix
Target Population: Juniors and seniors
Employer(s): Allied Signal, St. Joseph's Hospital, Motorola, U.S. Communications
Start Date: 1979

Contact: Gary Showers, Teacher/Program Coordinator, Central High School, 4525 N. Central Avenue, Phoenix AZ 85012. (602) 271-2361.

Pittsburgh: Cooperative Work Experience Program

Site: Pittsburgh high schools
Target Population: At-risk juniors and seniors
Occupation: Vocational trades
Employer(s): Rockwell International, Alcoa, Equicor, Veteran's Hospital, other small companies
Start Date: 1972

Contact: Brent Johnson, Program Facilitator, Division of Applied and Career Technology, 635 Ridge Avenue, Pittsburgh, PA 15212. (412) 323-3150.

Portland, Oregon: Partnership Project

Site: Portland high schools
Target Population: At-risk general track students
Employer(s): Safeway, Newbury's, U.S. Bancorp, Standard Insurance, First Interstate Bank, other local businesses including law firms
Start Date: 1984

Contact: Kathy Trevis, Director, Partnership Program, Grant High School, 2245 NE 36th Avenue, Portland, OR 97212. (503) 280-5160.

St. Augustine, Florida: Southeast Institute of Culinary Arts

Site: St. Augustine Technical Center
Target Population: Juniors and seniors seeking degrees in Culinary Arts
Occupation: Food service industry
Employer(s): Disneyworld, Sea World, Johnson County Community College, numerous other employers
Start Date: 1977; Department of Labor New Initiatives Program site

Contact: Edwin Brown, Executive Director, American Culinary Federation, PO Box 3466, St. Augustine, FL 32085. (904) 824-4468.

St. Louis: Work Study Program

Site: O'Fallon Vocational High School
Target Population: Any student who meets minimum requirements
Employer(s): Ralston Purina, McGraw-Hill, Citicorp, Community Based Banking, Shell Oil, St. Louis City Hall, Amoco
Start Date: 1972

Contact: Frank Logan, Manager, Work Study Programs, 5101 McRee Avenue, St. Louis, MO 63110. (314) 776-2215.

High School Academies

Academies are three year schools-within-schools, offering economically disadvantaged students an integrated academic-vocational education, career development and enrichment activities, extensive academic and nonacademic supports and employment opportunities. The academies link coursework to current and future employment in a local business or industry. Academy teachers work together with the same group of students over the three years and teach applied academic courses highlighting the connection between theory and practice.

Starting in Philadelphia twenty years ago, the academies are one of the few dropout prevention programs that have been evaluated systematically and have received positive results. Along with a decrease in dropout rates, most programs show improvement in student achievement and an increase in post-graduation employment.

There are approximately fifty academies in California, Pennsylvania, and Oregon. Contact persons in each state can be located in Partnerships for Learning: School Completion and Employment Preparation in the High School Academies, available from The Academy for Educational Development, 100 Fifth Avenue, New York, NY 10011. (212) 243-1110.

In addition to these academies, the National Academy Foundation, established about a decade ago by American Express, provides assistance to business-school partnerships that provide high-school juniors and seniors with a special two-year curriculum in a specific occupational field, as well as summer on-the-job internships in a related firm. NAF supports replications of several different programs: the Academy of Finance (35 schools in 17 cities); the Academy of Travel and Tourism (two cities); the Ford Academy of Manufacturing Sciences (one city). Contact: National Academy Foundation, 660 Madison Avenue, Suite 1804, New York, NY 10021. (212) 754-0040.

New York City: Academy of Finance

Site: Eight New York City high schools
Target Population: At-risk juniors and seniors
Employer(s): American Express, Shearson Lehman, other financial services firms
Start Date: 1982

Contact: Murray Tandler, Board of Education, New York City Academy of Finance, 131 Livingston Street, Room 509, Brooklyn, NY 11201. (718) 935-3776.

Oakland, California: Health Academy

Site: Oakland Technical High School
Target Population: At-risk youth, juniors and seniors
Employer(s): Kaiser Hospital, Children's Hospital, other hospitals in the area; branching into biotechnology employers
Start Date: 1985

Contact: Pat Clark, Lead Teacher, Oakland Tech, 4351 Broadway, Oakland, CA 94611. (415) 658-5300.

Oakland, California: The Media Academy

Site: Fremont High School
Target Population: At-risk students, sophomore through senior
Employer(s): Oakland Tribune, local media outlets
Start Date: 1985

Contact: Steve O'Donahue, Director, Fremont High School, 4610 Foothill Boulevard, Oakland, CA 94601. (415) 534-4381.

Redwood City, California: The Business Technology Academy

Site: Woodside and Carlmont High Schools
Target Population: At-risk juniors and seniors
Employer(s): IBM, Sun Microsystems, other local companies
Start Date: 1989

Contact: Marilyn Raby, Project Director, Sequoia Union District, 480 James Avenue, Redwood City, CA 94062. (415) 369-1411 x327.

Career Awareness and Preparation Programs

The programs described in this section include a range of efforts which, while not centered around work experience during the school year or the construction of learning opportunities based on students' work placements, do focus on career choices and learning about the world of work. These include programs that sensitize students to career possibilities and expose them to workplaces through structured interactions such as mentoring and shadowing. Also included are: two well-respected 2+2 Tech Prep programs, which go far beyond career awareness to structuring routes to further education or to employment in specific technical areas; and a program designed to alter the incentive structure for vocational students so that school performance becomes more closely linked to success in the labor market. Again, as in earlier sections, this list is representative rather than exhaustive.

Cambridge: Work Force Unemployment Prevention

Site: Cambridge public housing projects
Target Population: Teenagers (13–17) who are enrolled in school and live in public housing
Occupation: Wide range of occupations
Employer(s): Baybank, Harvard, MIT, Harvard Community Health, law firms, department stores, etc.
Start Date: 1983

Contact: Steven Swanger, Director of Tenant Services, Cambridge Housing Authority, 270 Green Street, Cambridge, MA 02139. (617) 864-3020 x219.

Cincinnati: Building Bridges to Jobs

Site: Aiken High School
Target Population: At-risk 9th graders
Employer(s): Numerous local businesses
Start Date: 1989. Pilot project in progress through grant from Department of Labor

Contact: Mary Holter, Project Director, Aiken High School, 5641 Belmont Avenue, Cincinnati, OH 45224. (513) 853-2634.

Fort Worth: Project C-3: Community, Corporations, Classrooms

Site: Fort Worth Independent School District
Target Population: All students, starting in summer between 8th and 9th grades
Employer(s): 100 (e.g. American Airlines, General Dynamics, Bell Helicopter, Pier 1 Imports, Tandy Corporation, IBM)
Start Date: Summer 1991

Contact: Dr. Gary Standridge, Director of Research, Evaluation and Development, Fort Worth Independent School District, 3210 West Lancaster, Fort Worth, TX 76107. (817) 878-3807.

Louisville, Kentucky: Student Career Introduction Program

Site: Jefferson County Public Schools
Target Population: Economically disadvantaged juniors and seniors who achieve academically
Occupation: Accounting, architecture, law, computer science and engineering focusing on non-traditional placements
Employer(s): Capital Holding, Wendy's and other private and public sector employers
Start Date: 1987

Contact: Angelo Viccaro, Executive Director, Louisville Education and Employment Partnership, 305 W. Broadway, Suite 506, Louisville, KY 40202. (502) 581-9155.

North Carolina: Tech Prep Development Center

Site: Richmond County
Target Population: Juniors and seniors
Occupation: Various industries
Employer(s): Local businesses
Start Date: 1985

Contact: Myrtle Stogner, Director, North Carolina Technical Prep Leadership Development Center, PO Box 1189, Hamlet, NC 28345. (919) 582-7187.

Portland, Oregon: Tech Prep Program

Site: Hillsboro High School and Portland Community College
Target Population: Juniors and seniors
Occupation: Wide range of technology occupations
Start Date: 1985

Contact: Al Miller, Director of Vocational/Technical Education, Hillsboro Union High School, 759 S.E. Washington, Hillsboro, OR 97123. (503) 640-4604.

Tampa: Worklink

Site: Hillsborough County Public Schools
Target Population: Vocational Education students
Employer(s): Tampa Electric, Colonial Pen, Metropolitan Life Insurance, Sun Bank, others
Start Date: 1989

Contact: Ron Selewach, President, Human Resources Management

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